STEPANOV, B.I.

KOZLOV, V.V.; STEPANOV, B.I.

Rate of diazotization of *p*-anisidine. Zhur. Fiz. Khim. 27, 3-5 '53. (CA 47 no.22:11918 '53) (MLRA 6:2)

1. D.I.Mendeleyev Chem.-Technol. Inst., Moscow.

STEPANOV, B. I.

USSR

Analysis of indophenols by titration with ascorbic acid. B. I. Stepanov and V. A. Sergienko. *Trudy Komissii Anal. Khim., Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 3(8), 274–8(1951).—Ascorbic acid (I) reduces indophenols slowly but air oxidizes them again. Most of the I is added rapidly to the sample, the soln. allowed to stand 10–15 min. with periodic shaking, and then the titration finished in 1–2 min. with energetic shaking of the sample. A preliminary titration is necessary to find how much I to add in the first addn. Inert gas atm. is not needed. I soln. is prepd. by dissolving a weighed amt. in 2% H_2SO_4 which has been prepd. from boiled H_2O. This soln. is standardized with KIO_3 and keeps 1–2 days. If pure I is used the standardization is omitted. One mole I reduces 1 mol. indophenol. E.g., 0.0458 g. of paste of the indophenol of isotoluidine and *p*-nitrosophenol is dissolved in alc. and dild. to 100 ml. A 2.5-ml. aliquot is dild. with 20 ml. alc. and titrated with 0.001*M* I. Most of the I (the amt. estd. from previous titration) is added and the sample allowed to stand 10–12 min. Titration is then continued dropwise with shaking to decolorization of soln. This last titration takes 1–1.5 min. This sample required 1.90 ml. I which calcd. to 35.2% indophenol. Plant samples of 7 indophenol pastes were analyzed by Mohr salt titration and by the above method. Typical results were 22.7, 22.1% by Mohr salt, 22.5, 22.3% by I titration. Eurilla Mayerle

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(1)

STEPANOV, B.

DAVYDOV, S.D.

Book on the history of chemistry ("History of the great law. B.Stepanov. Reviewed by S.D.Davydov.) Khim.v shkole 9 no.4:66-70 Jl-Ag '54. (MLRA 7:8)

(Chemistry--History) (Stepanov, B.)

STEPANOV, B.I.; VINNIKOV, Ye.A.; LISITSYNA, Ye.S.

Nature of the primary products of the interaction of amines with nitrous acid. Zhur.ob.khim. 25 no.9:1794-1798 S '55.(MIRA 9:2)

1.Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I.Mendeleyeva.
(Amines) (Nitrous acid)

STEPANOV, Boris Ivanovich; SAVEL'YEVA, R.N., redaktor; SMIRNOVA, M.I. tekhnicheskiy redaktor

[Story of a great law] Istoriia velikogo zakona. Izd. 3-e. Moskva, Gos. uchebno-pedagog. izd-vo M-va prosv. RSFSR, 1956. 188 p. (MLRA 10:4)
(Chemistry--History)
(Mendeleyev, Dmitriy Ivanovich, 1834-1907)

STEPANOV, B. I.

USSR/ Chemistry - Organic compounds

Card 1/1 Pub. 147 - 5/35

Authors : Stepanov, B. I.

Title : The color theory of organic compounds. Part 2.

Periodical : Zhur. fiz. khim. 30/1, 34-49, Jan 1956

Abstract : The factors weakening the polarizing effect of electrodonor and electronphilic substitutes, the levelness magnitude of molecules and the complex formation with metals were investigated with respect to the color of organic compounds. Data are presented regarding the light absorption by organic compounds based on concepts of concrete molecular structure not connected with the so-called theory of resonance. Twenty-eight references: 5 USSR, 16 Germ. 6 USA and 1 French (1930-1955). Tables.

Institution : Moscow Chemicotechnologigal Inst. im. D. I. Mendeleyev

Submitted : April 9, 1955

AUTHORS: Stepanov, B. I., Dedyukhina, L. A., Strashnova, T. T. SOV/79-28-7-43/64

TITLE: On the Substitution of the Halogen in Azo Compounds(O zameshchenii galogena v azosoyedineniyakh)II. The Reaction of 2-Chlorobenzeneazo-2'-Naphthene With Phenolates (II. Vzaimodeystviye 2-khlorbenzolazo-2'-naftola s fenolyatami)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol. 28, Nr 5, pp 1921 - 1925 (USSR)

ABSTRACT: In the previous paper (Ref 4) the chlorine atom in the o-chloro-o"-oxyazodye was substituted by the alkoxy group. In place of the latter group the authors this time used the aroxy group. The principal difference consists only of the fact that in the present case the above-mentioned dye is not subjected to the action of alcoholate in a practically anhydrous medium, but that it is subjected to that of phenolate in aqueous alkali liquor, in which case, according to Delfs (Del'fs)(Refs 2,3) the substitution of chlorine by the oxy group takes place under the formation of an unstable copper complex of the dioxyazo dye. In the patent of Delfs besides the oxy group no further

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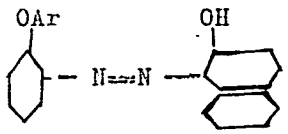
substituents are mentioned (Ref 4). On the heating of 2-chloro-benzeneazo-2'-naphthene at the reflux condenser at 100-110° with vitriol and aqueous alkali solutions of phenol, o-,m- and p-cresol, 1,3,5- and 1,2,4 xylenol, as well as also with 4-(1 ,1' ,3' ,3'-tetramethylbutyl)phenolates in the xylene medium the authors obtained compounds in high yields in which the chlorine atom was substituted by the corresponding aroxy groups. These dyes are derivatives of the o-aminodiphenyl ether and of its homologs:



The control tests in the absence of copper salt were negative. Thus the authors succeeded in substituting chlorine by the aroxy groups in the above mentioned dye in phenyl-,2-methyl-

On the Substitution of the Halogen in Azo Compounds. SOV/79-28-7-43/64
II. The Reaction of 2-Chlorobenzeneazo-2'-Naphthene With Phenolates

phenyl-,3-methylphenyl-,4-methylphenyl-,3,5-dimethylphenyl-, 2,4-dimethylphenyl and 4-(1',1',3',3'-tetramethylbutylphenyl) radical. These dyes have the same coloring properties as the ones found earlier. There are 6 references, 4 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva (Chemical and Technical Institute imeni D.I.Mendeleyev)

SUBMITTED: June 26, 1957

1. Thionaphthenes--Chemical reactions 2. Substitution reactions
3. Phenolic esters--Chemical reactions 4. Dyes--Chemical analysis

Card 3/3

AUTHORS: Stepanov, B. I., Salivon, M. A., Lagidze, V. F., Dedyukhina, L. A.

SOV/79-28-7-42/64

TITLE: On the Substitution of the Halogen in Azo Compounds (O zameshchenii galogena v azosoyedineniyakh) I. The Substitution of Chlorine in 2-Chlorobenzeneazo-2'-Naphthene by the Alkoxy Group (I. Zamena khlora v 2-khlorbenzolazo-2'-naftole na alkoksigruppy)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol. 28, Nr 7, pp 1915 - 1921 (USSR)

ABSTRACT: The substitution of the aromatically bound halogen atom by other substituents encounters much more difficulties than similar reactions in the aliphatic series. Only the activating influence from behalf of the electrophile substituent as well as the catalytic effect of copper and its compounds make it possible to carry out the substitution reactions at temperatures below 200°. With regard to the theoretical importance of the problem concerning the reasons of the anomalous mobility of the atomic halogen in the ortho position to the azo group

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the preparative possibilities of the reactions mentioned in references 2 to 12 in the case of slight reduction cleavage of the azo dyes formed were of interest to the authors, especially since this problem has been touched only in patent literature hitherto. 2-chlorobenzeneazo-2'-naphthene, i.e., the azo dye of 2-chloroaniline and 2-naphthene was used as initial substance. The substitution of the chlorine atom by the alkoxy groups with the methyl-, ethyl-, n-butyl-, isoamyl-, n-hexyl, n-octyl- and n-octadecyl radicals was obtained by the conversion of the sodium alcoholates with this dye. It was shown that the substitution in the given o-halogen-o'-oxyazo dye in the presence of copper salt takes place on mild conditions. Some of the synthesized dyes may be used in the dyeing of acetate- and polyamide fibers according to the suspension method. There are 17 references, 11 of which are Soviet.

On the Substitution of the Halogen in Azo Compounds. SOV/79-28-7-42/64
I. The Substitution of Chlorine in 2-Chlorobenzeneazo-2'-Naphthene by the Alkoxy Group

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva (Moscow Chemical and Technical Institute imeni D.I. Mendeleyev)

SUBMITTED: July 10, 1957

1. Thionaphthenes--Chemical reactions 2. Alkoxy radicals--Chemical reactions 3. Substitution reactions--Analysis 4. Copper--Catalytic properties 5. Dyes--Synthesis

Card 3/3

STEPANOV, B.I.; ANDREYEVA, M.A.

Substitution of halogen into azo compounds. Part 3: Preparation of o-arylalkoxyaniline derivatives. Zhur.ob.khim. 28 no.9: 2490-2491 S '58. (MIRA 11:11)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva.

(Aniline)

AUTHOR: Stepanov, B. I.

SOV/79-28-10-11/60

TITLE: On the Halogen Substitution in Azo Compounds (O zameshchenii galogena v azosoyedineniyakh) IV. Substitution of Chlorine in 5-Methyl-2-Chloro-Benzene-Azo-2'-Naphthol by the Alkoxy and Aroxy Groups, and Synthesis of the Ethers of 3-Amino-4-Oxy Toluene (IV. Zameshcheniye khlora v 5-metil-2-khlorbenzolazo-2'-naftole na alkoksi-i aroksigruppy i polucheniye prostykh efirov 3-amino-4-oksitoluola)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol 28, Nr 10, pp 2676-2682 (USSR)

ABSTRACT: The author also employed his method of substituting chlorine in the o-halogen-o'-oxy azo dyes as, for instance, investigated with 2-chlorobenzene azo-2'-naphthol (Refs 1-3) with other compounds. He obtained several azo dyes, derivatives of the 3-amino-4-oxy toluene ether, from 5-methyl-2-chloro-benzene azo-2'-naphthol (Scheme). The reaction with alcoholates is best carried out in a mixture of the corresponding alcohol with an inert solvent (toluene,xylene) as this saves alcohol and makes the separation of the reaction product and its purification easier. The synthesized dyes dye acetate and polyamide fibers.

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On the Halogen Substitution in Azo Compounds. SOV/79-28-10-11/60
IV. Substitution of Chlorine in 5-Methyl-2-Chloro-Benzene-Azo-2'-Naphthol by the Alkoxy and Aroxy Groups, and Synthesis of the Ethers of 3-Amino-4-Oxy Toluene

Some 3-amino-4-oxy toluene ethers were obtained by the reduction cleavage of these dyes (Scheme 2). Thus, the chlorine atom was substituted by various alkoxy and aroxy groups in the presence of copper salt with the ethyl-, n-butyl-, benzyl-, phenyl radical and other radicals by the reaction of sodium alcoholates and phenolates with azo dyes obtained from 3-amino-4chloro-toluene and 2-naphthol. There are 3 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni D. I. Mendeleyeva
(Moscow Chemical and Technological Institute imeni D. I. Mendeleyev)

SUBMITTED: August 8, 1957

Card 2/2

AUTHORS: Andreyeva, M. A., Stepanov, B. I. SOV/79-28-11-14/55

TITLE: On the Substitution of the Halogen in Azo Compounds (O zameshchenii galogena v azosoyedineniyakh) V. Reaction of the Copper Complex of 2-Chloro-Benzene Azo-2'-Naphthol With Alcoholates (V. Vzaimodeystviye mednogo kompleksa 2-khlorbenzolazo-2'-naftola s alkogolyatami)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol 28, Nr 11, pp 2966 - 2967 (USSR)

ABSTRACT: To explain the mechanism of the substitution of the halogen atoms in o-halogen-o'-oxy-azo dyes in the presence of copper salts (Ref 1) it was important to carry out this reaction using the complex compound of a halogen containing dye with copper and without the free copper salt. First the reaction of the copper complex of 2-chloro-benzene azo-2'-naphthol (the azo dye from 2-chloro-aniline and 2-naphthol) with alcoholates of n.-butyl and benzyl alcohol was carried out. The copper complex of the chlorine containing dye was obtained according to Crippa (Krippa, Ref 2) in a somewhat modified form by the reaction with copper

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ammonia solution on its heating in acetone instead of alcohol. According to the analysis this complex contains one copper atom per two dye molecules, and apparently has the mentioned structure (I). The reaction of the complex with sodium butylate and sodium benzylate in the solution of the corresponding alcohol was carried out at 100-103° within 8 hours. From the reaction products dyes were separated that turned out to be the products of the substitution of the chlorine atom by the corresponding butoxy and phenyl methoxy group (94.3 and 95.0%). Thus, the chlorine atom in the copper complex was substituted practically quantitatively by the alkoxy groups in the presence of the free copper salt. The dyes were identified according to the melting point of the mixed sample with the corresponding alkoxy substituted dyes. There are 3 references, 2 Soviet references.

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001653130011-0"

On the Substitution of the Halogen in Azo Compounds. V. Reaction of the Copper Complex of 2-Chloro-Benzene-Azo-2'-Naphthol With Alcoholates

SOV/79-28-11-14/55

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I.Mendeleyeva (Moscow Chemotechnological Institute imeni D.I.Mendeleyev)

SUBMITTED: August 31, 1957

Card 3/3

AUTHORS: Stepanov, B. I., Savel'yev, V. A. SOV/79-28-11-15/55

TITLE: The Substitution of the Halogen in Azo Compounds (O zameshchenii galogena v azosoyedineniyakh) VI. Substitution of Chlorine by the Methoxy Group in 2-Oxy-8'-Chloro-(1,1')-Azonaphthalene and Its Copper Complex (VI. Zamena khlora na metoksigruppu v 2-oksi-8'-khlor-(1,1')-azonaftaline i yego mednom komplekse)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol 28, Nr 11, pp 2968 - 2971 (USSR)

ABSTRACT: In the reaction of the complex (I) with alcoholates Stepanov and his collaborator substituted the chlorine atom by the alkoxy group in the presence of a copper salt, thanks to the high mobility of this chlorine atom. This high mobility could be explained by the formation of a positive charge in the nitrogen atom of the azo group. If this is correct the chlorine atom in the copper complex (II) would have to display an inferior mobility, i.e.the influence exerted by the positive charge of the nitrogen atom on the bond of

Card 1/3

chlorine with the carbon of the naphthalene nucleus in the peri-position must be very low. The 1,8-amino-chloro naphthalene necessary for the synthesis of the initial product, the 2-oxy-8'-chloro-(1,1')-azo-naphthalene, was obtained by the chlorination of 1,8-nitro-naphthalene and by the subsequent reduction of the obtained 1,8-nitro-naphthalene. It was found that in the reaction of the 2-oxy-8'-chloro-(1,1')-azonaphthalene with sodium methylate in the presence of copper sulfate in the mixture of toluene and methyl alcohol already on the water bath a quantitative substitution of the chlorine atom by the methoxy group takes place, and that therefore the halogen atom in the o-halogen-o'-oxy-azo dyes has a mobility equal to that of the peri-halogen-o'-oxy-azo dyes. The copper complex separated is cleft by hydrochloric acid on boiling. Without copper sulfate this reaction does not take place. The synthesized methoxy substituted dye dyes the acetate fiber according to the suspension method. The synthesis of 1,8-amino-

The Substitution of the Halogen in Azo Compounds. VI. Substitution of Chlorine by the Methoxy Group in 2-Oxy-2'-Chloro-(1,1')-Azonaphthalene and Its Copper Complex

SOV/79-28-11-15/55

chloro naphthalene was improved. There are 8 references, 4 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva (Moscow Chemotechnological Institute imeni D.I.Mendeleyev)

SUBMITTED: September 30, 1957

Card 3/3

STEPANOV, Boris Ivanovich; BRUSILOVSKAYA, M.S., otv.red.; TISHINA, Z.V., tekhn.red.

[Chemistry in the first stage] Khimiia - na pervom rubezhe. Moskva, Gos.izd-vo detskoi lit-ry M-va prosv.RSFSR, 1959. 30 p. (MIRA 12:8)
(Chemistry--Juvenile literature)

5(3) SOV/156-59-1-36/54

AUTHORS: Stepanov, B. I., Andreyeva, M. A.

TITLE: On the Substitution of Halogen Atoms in o,o-Dihalogen-o'-oxyazo-dyes (O zameshchenii atomov galogena v o,o-digalogen-o'-oksiazokrasitelyakh)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1959, Nr 1, pp 141 - 142 (USSR)

ABSTRACT: For the investigation into the mobility of halogen atoms in o-halogen-o'-oxy compounds (Refs 1,2,3), 2,6-dichlorobenzene-(1-azo-1')-naphthol-2', an azo-dye from 2,6-dichloro-aniline and 2-naphthol, was used as an initial substance. This o-oxyazo compound thus contained two halogen atoms in an ortho-position with regard to the azo-group. It was found that on the reaction of this substance with alcoholates (sodium-n-butylate) and phenolates (Na-4-phenyl-phenolate) in the presence of copper salts a practically quantitative substitution by the respective alkoxy- or phenoxy-group of the two halogen atoms takes place. This substitution occurs far more readily than it does in the analogous compounds containing only one halogen atom. The experimental part gives instructions

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On the Substitution of Halogen Atoms in o,o-Dihalogen-o'- SOV/156-59-1-36/54
oxyazo-dyes

for the preparation of the dichloro-azo dyes and for the substitution of the chlorine atoms by butoxy- and 4-phenyl-phenoxy-groups, respectively. There are 3 Soviet references.

ASSOCIATION: Kafedra tekhnologii organicheskikh krasiteley i promeshutochnykh produktov Moskovskogo khimiko-tekhnologicheskogo instituta im. D. I. Mendeleyeva (Chair of the Technology of Organic Dyes and Intermediate Products of the Moscow Institute of Chemical Technology imeni D. I. Mendeleyev)

SUBMITTED: October 28, 1958

Card 2/2

STEPANOV, B.I.; ZAKHAROVA, M.V.

Relation between the structure of dyes and color properties.
Izv.vys.ucheb.zav.; tekh.tekst.prom. no.1:148-157 '59.
(MIRA 12:6)

1. Moskovskiy khimiko-tekhnologicheskiy institut im. D.I. Mendeleyeva.
(Dyes and dyeing--Wool)

STEPANOV, B.I.; ZAKHAROVA, M.V.

Relation between dye composition and color properties. Part 2. Izv.vys.ucheb.zav.; tekh.tekst.prom. no.2:117-124 '59. (MIRA 12:6)

1. Moskovskiy khimiko-tekhnologicheskiy institut im. D.I. Mendeleyeva.
(Dyes and dyeing--Chemistry)

5(3), 24(7)

AUTHORS: Stepanov, B. I., Fokin, Ye. P. SOV/156-59-2-33/48

TITLE: The Absorption Spectra of Some Anthrachinon- and Anthrapyridon-derivatives (Spektry pogloshcheniya nekotorykh antrakhinonovykh i antrapiridonovykh proizvodnykh)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1959, Nr 2, pp 346-349 (USSR)

ABSTRACT: The spectra of 1-methylamino-4-bromide-anthrachinon (I), N-acetyl-1-methylamino-4-bromide-anthrachinon (II), N-methyl-4-bromide-anthrapyridon (III), N-methyl-(2'-chlorophenylamino)-anthrapyridon (IV), N'-acetyl-N-methyl-(2'-chlorophenylamino)-anthrapyridon (V) and N-methyl-N'-(2-chlorophenyl)-anthradi-pyridon (VI), were examined. They are shown (Fig 1) and (Fig 2). The polarizing influence of the strong electronophile carbonyle group results in a stable distribution of the electron density. An electron-donor substituent in position 1 (or 4) comes therefore into reaction with the carbonyl group 9 (or 10). The maximum λ = 502 mμ of the compound I is in accordance with this assumption, the acylating of the methyl-aminegroup (Compound II) makes this maximum disappear. The closing of the pyridine ring - the transition from anthrachinon

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derivative to anthrapyridon derivative - completely changes the absorption curve (Compound III). But here also, an electron-donor-substituent in position 4 (Compound IV) can come into reciprocal action with the carbonylgroup 10, so that by introducing the 2-chlorophenylaminogroup at compound IV, a maximum λ = 532 mμ occurs. This also disappears when acylating the phenylaminogroup (Compound V). During the transition to the anthradipyridon derivative (Compound VI) the absorption curve undergoes a new change and is now characterized by the splitting of the maxima. The spectrophotometric pictures were made by V. A. Plakhov and T. D. Rubina, to whom the authors express their gratitude. There are 2 figures and 2 references.

PRESENTED BY: Kafedra tekhnologii organicheskikh krasiteley i promezhutochnykh produktov Moskovskogo khimiko-tekhnologicheskogo instituta im. D. I. Mendeleyeva (Chair of the Technology of Organic Dyestuffs and Intermediate Products, Moscow Institute of Chemical Technology imeni D. I. Mendeleyev)

SUBMITTED: December 29, 1958

STEPANOV, B., kand. khim. nauk

Large and small molecules (to be continued). IUn. tekh. 3 no.6:42-45 Je '59. (MIRA 12:8)
(Molecules)

STEPANOV, B., kand.khim.nauk

Large and small molecules (conclusion). .IUn.tekh. 3 no.7:33-37 Jl '59. (MIRA 13:8)
(Textile chemistry)

SOV/79-29-9-54/76

5(3)

AUTHORS: Stepanov, B. I., Arinich, L. N.

TITLE: On the Substitution of the Halogen in Azo Compounds. VII. The Substitution of Chlorine in 2-Oxy-8'-chloro-(1,1')-azonaphthalene by Aroxy Groups

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 9, pp 3052-3054 (USSR)

ABSTRACT: In a paper by B. I. Stepanov, V. A. Savel'yev (Ref 1) the reaction of 2-oxy-8'-chloro-(1,1') azonaphthalene (an azo dyestuff consisting of 1,8-aminochloro naphthalene and 2-naphthol) and its copper complex with sodium methylate was investigated. It is shown that in the first case in the presence of $CuSO_4$, in the second case without addition of the free copper salts, a quantitative substitution of the chlorine atom by the methoxy group takes place easily. It was of interest to investigate whether a substitution of chlorine in this peri-chloro-o'-oxyazo dyestuff may take place by the aroxy groups. This seemed evident because the patent of Delfs (Ref 2) pointed to the substitution of chlorine in dyestuffs of similar type. However, only one example, the reaction with ethyl alcohol, was given

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On the Substitution of the Halogen in Azo Compounds. VII. The Substitution of Chlorine in 2-Oxy-8'-chloro-(1,1')-azonaphthalene by Aroxy Groups

and the reaction with phenols was not described at all. Earlier (Refs 3,4) it was shown that in the o-halogen-o'-oxyazo compounds which have a halogen lability comparable to the peri-halogen-o'-oxyazo compounds, the halogen may be replaced by the aroxy group. In the present paper it was found that the reaction does not take place in the reaction of the initial dyestuff with phenolates and creolates in water in the presence of $CuSO_4$ in heating within 10 hours to 105-110°, whereas the same reaction with o-chloro-o'-oxyazo dyestuffs takes place under the same conditions without difficulties. In dioxane solution, by the use of acetic copper, the reaction which took place during 4 hours at 100° furnished a yield of 84-86%. Dioxane proved to be a convenient solvent since its final products are easily separated from it by the dilution with the reaction amount of water (or with 10% sulfuric acid which simultaneously also destroys the copper complex of the substituted dyestuff). There are 4 references, 3 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni D. I. Mendeleyeva (Moscow Institute of Chemical Technology imeni D. I. MENDELEYEV

Card 2/3

S/153/60/003/003/033/036/XX
B016/B058

AUTHORS: Stepanov, B. I., Nozdrani, N. S., Ogoleva, L. N.

TITLE: Production of 2-Oxycarbazole From o-Chlorometanilic Acid

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya. 1960, Vol. 3, No. 3, pp. 480 - 483

TEXT: The authors report on the synthesis of 2-oxycarbazole (VII) from the easily producible o-chlorometanilic acid (I). The synthesis of these initial substances important for dyes was thus greatly simplified. The authors proceeded according to the scheme attached. The moncazo dye (II) was obtained in the usual way from (I) with β-naphthol with a yield of 98%. (II) was converted into the symmetric diazo dye (III) according to Delʻfs (Ref.1), with a yield of 98%. (III) underwent a reducing cleavage with tin in HCl, the tin being subsequently regenerated by electrolysis and 2,2'-diamino-biphenyl-4,4'-disulfo acid (IV) was thus obtained with a yield of 97%. The heterocycle (carbazolization) was closed on the basis of the reaction by H. Leditschke (Ref.2). In this connection

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the authors established that satisfactory results may only be obtained at a maximum of 150°C. Pure 2,7-carbazole disulfo acid (V) forms under these conditions with a 95% yield. Among different tested variants of the alkaline melting of (V), the authors found out the best one: 2-oxycarbazole-7-sulfo acid (VI) forms at 300°C with a yield of 88% if alkaline melting (3 mole alkali per 1 mole of (VI)) is performed in the solution under pressure (according to N. N. Vorozhtsov, Ref.3). (VI) was subsequently hydrolyzed by heating with 10% H_2SO_4 under pressure (Ref.4). Best results were obtained at 200°C within 20 hrs. The total yield of 2-oxycarbazole (VII), related to (I) used, amounted to 72% of the theoretical one. The sulfo acids (II) to (VI) as well as (I) were identified as benzyl thiuronium salts (Table p. 483, I-VI) (Ref.5). The authors proved that (VI) reacts with benzyl thiuronium in the same way as a dibasic acid, its oxy-group participating in the salt formation with the cation of benzyl thiuronium beside the sulfo group. There are 1 table and 8 references: 4 Soviet, 2 German, and 1 US.

Production of 2-Oxycarbazole From o-Chlorometanilic Acid

S/153/60/003/003/023/036/XX
B016/B058

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva; Kafedra tekhnologii organicheskikh krasiteley i promezhutochnykh produktov (Moscow Institute of Chemical Technology imeni D. I. Mendeleyev; Chair of Technology of Organic Dyes and Intermediate Products)

SUBMITTED: September 11, 1958

Card 3/3

S/079/60/030/04/69/080
B001/B011

AUTHORS: Andreyeva, M. A., Stepanov, B. I.

TITLE: On the Substitution of Halogen in Azo Compounds. IX. Influence of the Position of Halogen and of Nucleophilic Substituents, and of the Nature of Nucleophilic Substituents

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol. 30, No. 4, pp. 1350-1356

TEXT: With a view to determining the limits of applicability of the substitution of the halogen atom in azo compounds, the authors of the present paper carried out the reaction of n.-sodium butylate with chlorine-containing azo compounds in the presence of copper salts differing by the position of the chlorine atom and of the nucleophilic substituents in relation to the azo group, and also by the character of nucleophilic substituents. The substitution of the halogen atom in azo compounds was found to take place only in the case of the vicinity (ortho-position) of the halogen atom and of the nucleophilic substituents to the azo group, as well as in the presence of a mobile hydrogen in the structure of the nucleophilic substituent. The reaction is the easier, the easier hydrogen is replaced by metal. It was found that

On the Substitution of Halogen in Azo Compounds. IX. Influence of the Position of Halogen and of Nucleophilic Substituents, and of the Nature of Nucleophilic Substituents

S/079/60/030/04/69/080
B001/B011

the halogen atom in azo dyes can be replaced by arylides of β-keto acids and amines as the azo components. The halogen atom was found to be replaced by the alkoxy group on the reaction of the copper complex of o-halogen-o'-amino dye with alcoholates, without free copper salt. On heating the azo dye, which contains a methoxy group in the naphthalene ring in the ortho-position to the azo group, with sodium butylate in the presence of a copper salt, the methyl residue in the ester group is replaced by the butyl group. There are 2 tables and 12 references, 6 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni D. I. Mendeleyeva (Moscow Institute of Chemical Technology imeni D. I. Mendeleyev)

SUBMITTED: March 14, 1959

Card 2/2

STEPANOV, B.I.

Substitution of halogen in azo compounds. Part 10: Synthesis of monoethers of 2,2'-dihydroxy-1,1'-azonaphthalene and ethers of 1-amino-2-naphthol. Zhur.ob.khim. 30 no.6: 2008-2014 Je '60. (MIRA 13:6)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva.
(Azo compounds) (Azonaphthalene) (Naphthol)

STEPANOV, B.I.; ANDREYEVA, M.A.

Substitution of the halogen in azo compounds. Part 11: Significance of certain space factors. Zhur.ob.khim. 30 no.8:2748-2754 Ag '60. (MIRA 13:8)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva.
(Azo compounds) (Substitution (Chemistry))

ANDREYEVA, M.A.; STEPANOV, B.I.

Substitution of the halogen in azo compounds. Part 12: Influence of the nature of the halogen. Zhur.ob.khim. 30 no.8:2768-2771 Ag '60. (MIRA 13:8)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva.

(Azo compounds) (Substitution (Chemistry))

ROZANEL'SKAYA, N.A.; STEPANOV, B.I.

Substitution for the halogen in azo compounds. Part 13: Substitution of alkoxy and aroxy groups for the chlorine atoms of disazo dyes from 3,3' -dichlorobenzidine and the synthesis of 4,4 -diamino-3,3'-dioxybiphenyl ethers. Zhur. ob. khim. 31 no.3:758-764 Mr '61. (MIRA 14:3)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D. I. Mendeleyeva.
(Ethers) (Substitution (Chemistry))
(Azo compounds)

STEPANOV, B.I.

Sun - eye - color. Priroda 50 no. 2:18-22 F '61. (MIRA 14:2)
(Color) (Dyes and dyeing)

PISKUNOV, A.K.; SHIGORIN, D.N.; STEPANOV, B.I.; KLINSHPONT, E.R.

Paramagnetic resonance of solutions of certain oxyazo copper compounds. Dokl. AN SSSR 136 no.4:871-874 F '61. (MIRA 14:1)

1. Fiziko-khimicheskiy institut imeni L.Ya. Karpova i Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva. Predstavleno akademikom V.A. Karginym.
(Copper compounds—Spectra)

STEPANOV, B.I. [Stsiapanau, B.I.]

Optical properties of lasers and optical amplifiers. Vestsi AN BSSR. Ser. fiz.-tekh. nav. no.2:17-25 '62. (MIRA 18:4)

STEPANOV, B.I. [Stiapanau, B.I.]; RUPANOV, A.I. [Rupanau, A.I.]

Entropy of the distribution of coordinates and the pulses of a harmonic oscillator. Vestsi AN BSSR. Ser. fiz.-tekh. nav. no.4: 30-36 '62. (MIRA 18:4)

STEPANOV, B.I.; VOROB'YEVA, I.I.; ANDREYEVA, M.A.

Substitution of halogen in azo compounds. Part 14: Substitution of chlorine in the azo dye of 3-chloro-3-aminoanthraquinone and 2-naphthol. Zhur.ob.khim. 32 no.10:3281-3283 O '62. (MIRA 15:11)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva.
(Azo dyes) (Chlorine)
(Substitution (Chemistry))

STEPANOV, B.I.; ROZANEL'SKAYA, N.A.; TRAVEN', V.F.

Substitution of the halogen in azo compounds. Part 5: Effect of the nature of metal. Zhur.ob.khim. 32 no.11:3737-3741 N '62. (MIRA 15:11)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendelyeva.

(Azo compounds)
(Salts) (Halogens)

STEPANOV, B.I.

Substitution of the halogen in azo compounds. Part 16: Substitution of chlorine in 2,6-dichloro(1-azo-1')benzene-2'-naphthol by alkoxy- and aroxy groups, and the preparation of 2,6-dihydroxyaniline ethers. Zhur.ob.khim. 32 no.11:3741-3745 N '62. (MIRA 15:11)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva.

(Azo compounds)
(Chlorine compounds) (Hydroxy compounds)

STEPANOV, B.I.; BOKANOV, A.I.

Conjugation capacity of phosphonyl groups. Zhur. ob. khim. 35 no.6:1124-1125 Je '65. (MIRA 18:6)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni Mendeleyeva.

STEPANOV, B.I.; MIGACHEV, G.I.

Cyanuropyridinium salts and their properties. Zhur. VKHO 10 no. 6:712 '65 (MIRA 19:1)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva. Submitted June 30, 1965.

OGOLEVA, L.N.; STEPANOV, B.I.

Ratio of isomers in azo coupling. Part 2:Effect of substituents in a molecule of a diazo constituent. Zhur. org. khim. 1 no. 12: 2083-2087 D '65 (MIRA 19:1)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni Mendeleyeva. Submitted November 25, 1964.

L 36496-66 EWT(m)/EWP(j) RM

ACC NR: AP6027088 SOURCE CODE: UR/0079/65/035/010/1879/1880

AUTHOR: Bokanov, A. I.; Korolev, B. A.; Stepanov, B. I.

ORG: Moscow Chemical Engineering Institute im. D. I. Mendeleyev (Moskovskiy khimiko-tekhnologicheskiy institut)

TITLE: Basicity of phosphines and electronic properties of certain organo-phosphorus groups

SOURCE: Zhurnal obshchey khimii, v. 35, no. 10, 1965, 1879-1880

TOPIC TAGS: organic phosphorus compound, electric property, titrimetry, nitromethane, ionization, atom, phenyl compound, electron donor

ABSTRACT: Potentiometric titration in nitromethane at 25°C was used to determine the ionization constants $pK_a(H_2O)$ of a series of tertiary phosphines: $(C_2H_5)_3P$ 8.86, $(C_2H_5)_2PC_6H_5$ 6.41, $n\text{-}(C_2H_5)_2PC_6H_4Cl$ 5.68, and $P(C_6H_5)_3$ 2.61. The ionization constants of phosphines with aryl and ethyl substituents on the phosphorus are accurately described by the equation: $pK_a = -4.606 - 4.094\Sigma\sigma_\Phi$, where σ_Φ are the Kabachnik constants. The applicability of the latter to the calculation of ionization constants of aryl-substituted phosphines means that the free electron pair of the

UDC: 543.257.1+547.241+547.558.1

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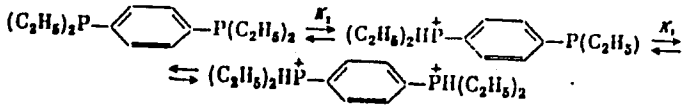
L 36496-66

ACC NR: AP6027088

phosphorus atom in the phosphino group in the basic (unexcited) state is not conjugated with the π system of the aryl group. Having determined both ionization constants of p-phenylenebisdiethylphosphine, pK_a^1 3.35, pK_a^2 6.57."



the authors found the values of σ_ϕ for the p-diethylphosphinophenyl and p-diethylphosphonium phenyl groups. The electron-donor property of the diethylphosphino group was found to be weak. The electron-acceptor property of the p-diethylphosphonium phenyl group is approximately the same as that of the p-ammonium phenyl groups.

Orig. art. has: 1 formula. [JPRS: 36,328]

SUB CODE: 07 / SUBM DATE: 03May65 / ORIG REF: 002 / OTH REF: 002

Card 2/2

L 22852-66 EWT(m)/EWP(j)/T WW/RM

ACC NR: AP6012216 SOURCE CODE: UR/0032/66/032/004/0416/0416

18
B

AUTHOR: Stepanov, B. I.; Migachev, G. I.

ORG: Moscow Institute of Chemical Technology im. D. I. Mendeleyev (Moskovskiy khimiko-tekhnologicheskiy institut)

TITLE: Determination of halogen in polyphosphonitrilic halides

SOURCE: Zavodskaya laboratoriya, v. 32, no. 4, 1966, 416

TOPIC TAGS: analytical chemistry, titrimetry, potentiometric titration, halogen determination, polyphosphonitrilic halide

ABSTRACT: Halogen content has been determined in trimers of phosphonitrilic chloride and bromide, in the tetramer of phosphonitrilic chloride, 1-bromo-2,4-dinitrobenzene, and 1-chloro-2,4,6-trinitrobenzene by a method simpler and more rapid than the previously used methods. The new method consisted in treating the sample with pyridine to form a pyridinium complex salt which is hydrolyzed by water to a pyridinium halide. Halide ions are determined by potentiometric titration with silver nitrate solution, using silver and calomel electrodes. Analytical data were given for all the compounds studied. Orig. art. has: 1 table and 1 formula. [JK]

SUB CODE: 07/ SUBM DATE: none/ ORIG REF: 001/ ATD PRESS: 4229

Card 1/1 BK

ACC NR: AP7000245 SOURCE CODE: UR/0079/66/036/004/0762/0763

AUTHOR: Stepanov, B. I.; Bokanov, A. I.; Korolev, B. A.

ORG: Moscow Chemico-technological Institute im. D. I. Mendeleev (Moskovskiy khimiko-tekhnologicheskiy institut)

TITLE: p-diethylphosphonylbenzoic acid

Moscow, Zhurnal Obshchey Khimii, Vol 36, No 4, 1966, pp 762-763

Abstract: p-Diethylphosphonylbenzoic acid was prepared by successive oxidation and saponification of p-carbethoxyphenyldiethylphosphine. The conversion of the phosphine to the acid was carried out under mild conditions. After determining the ionization constant of the acid, pK_a 367 ± 0.03, the authors calculated the value of $sigma_n$ 0.53 for the p-diethyloxophosphinic group according to the Hammett equation. The acid was converted to p-carbomethoxyphenyldiethylphosphine oxide in absolute methanol in the presence of concentrated sulfuric acid. The acid was titrated potentiometrically with sodium hydroxide in aqueous solutions. [JPRS: 37,177]

TOPIC TAGS: phosphinic acid, alkylphosphine, ionization constant

SUB CODE: 07 / SUBM DATE: 22 Oct 65 / ORIG REF: 003 / OTH REF: 001

UDC: 542.257.1 + 661.718.1 + 547.583

Card 1/1 0923 0788

SOV/86-58-8-35/37

AUTHOR: Stepanov, B.M., Engr Col, Docent, Candidate of Technical Sciences

TITLE: Textbook on Radar Methods Used in Selecting Moving Targets (Uchebnoye posobiye po radiolokatsionnym metodam selektsii dvizhushchikhsya tseley)

PERIODICAL: Vestnik vozdushnogo flota, 1958, Nr 8, pp 87-89 (USSR)

ABSTRACT: Critical review of the book "Radar Methods in Selecting Moving Targets" (Radiolokatsionnyye metody selektsii dvizhushchikhsya tseley), by P.A. Bakulev, published by the State Publishing House of Defense, Moscow, 1958, 100 pages.

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PHASE I BOOK EXPLOITATION SOV/2573

64), 7(7)

Stepanov, Boris Mikhaylovich

Radiolokatsionnyy obzor (Radar Scanning) Moscow, Voyen. izd-vo M-va obor. SSSR, 1959. 64 p. (Series: Radiolokatsionnaya tekhnika) No. of copies printed not given.

Ed.: A.V. Vrublevskiy, Engineer, Lt.-Colonel; Tech. Ed.: M.A. Strel'nikova.

PURPOSE: This booklet is intended for military officers working with radar equipment. It may also be of interest to the general reader.

COVERAGE: The author presents basic information for selecting parameters of systems for radar scanning and discusses various types of such systems. He describes various types of scans such as circular, sector and vertical plus horizontal scans and discusses methods of lobe switching. No personalities are mentioned. There are no references.

Card 1/3

Radar Scanning

TABLE OF CONTENTS:

Radar Scanning

AVAILABLE: Library of Congress

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L 22987-65
ACCESSION NR: AP5002317 S/0141/64/007/005/0865/0871

AUTHOR: Medvedev, Yu. A.; Protsenko, K. D.; Stepanov, B. M.

TITLE: Probability distribution of the time position of the signal threshold point at a detector output in the presence of noise

SOURCE: IVUZ. Radiofizika, v. 7, no. 5, 1964, 865-871

TOPIC TAGS: probability distribution, threshold signal, detector output, signal to noise ratio

ABSTRACT: A system is considered, consisting of a zero-lag detector and a narrow-band filter with a spectral characteristic that is symmetrical about the center frequency. The sinusoidal input signal is modulated by a slowly-varying smooth function. The authors analyze the output produced by this signal in conjunction with Gaussian noise at the input. Non-stationary processes in the detector fluctuations are assumed to be small, and the

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L 22987-65
ACCESSION NR: AP5002317

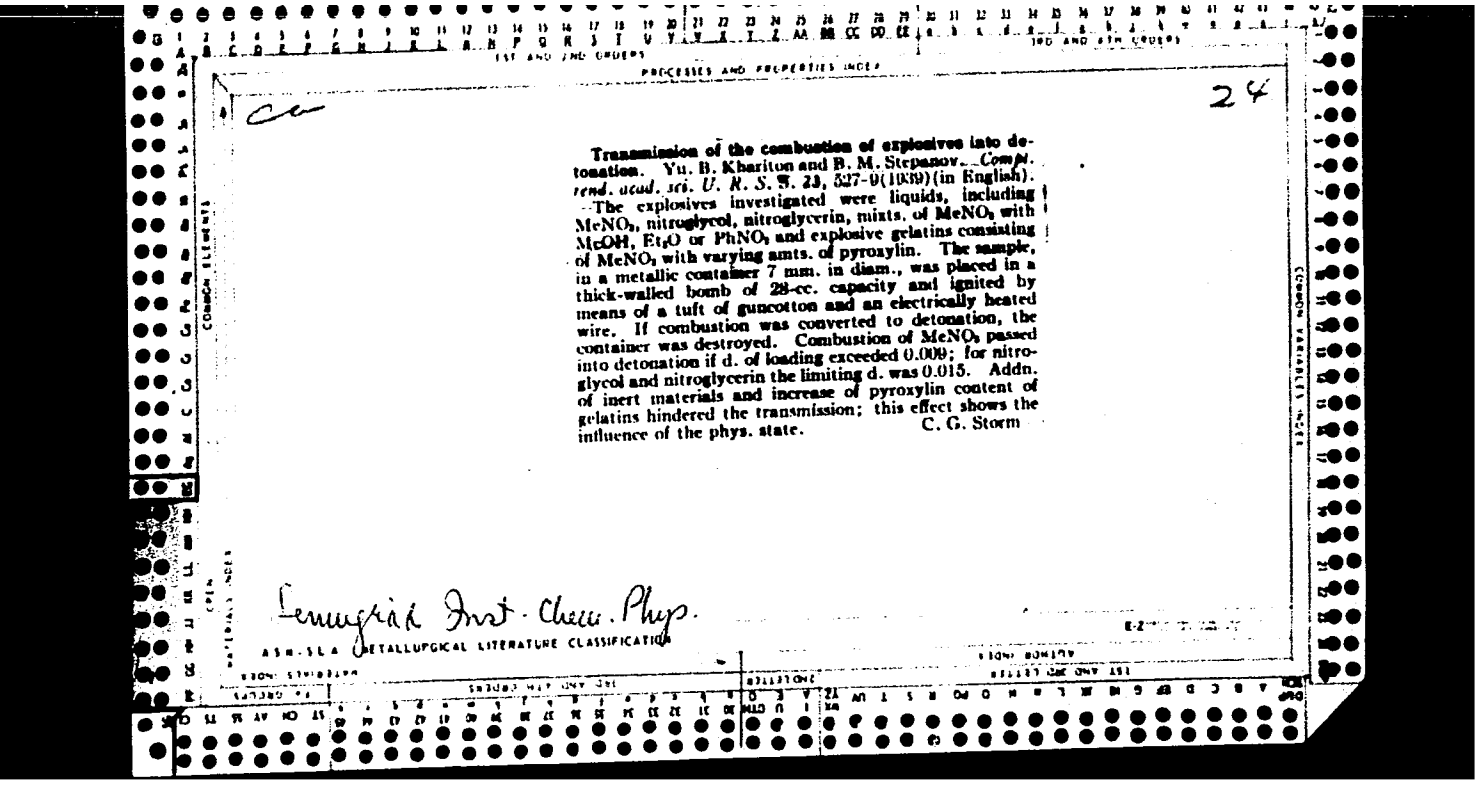
time when the envelope of the voltage passes through a fixed level. This problem is similar to one considered earlier by V. I. Tikhonov (Vestnik MGU v. 5, 31, 1956) as applied to an electronic relay. It is shown that the probability of a given value of the time constant is decreasing with increasing signal/noise ratio. "The authors thank Yu. S. Sayasov for useful remarks." Orig. art. has: 2 figures and 19 formulas.

ASSOCIATION: None

SUBMITTED: 21Oct63 ENCL: 00 SUB CODE: EC

NR REF SOV: 003 OTHER: 002

Card 2/2



PROCESSES AND PROPERTIES INDEX

24

Transmission of the combustion of explosives into detonation. Yu. B. Khariton and B. M. Stepanov. *Compt. rend. acad. sci. U. R. S. S.* **23**, 527-9(1939)(in English).—The explosives investigated were liquids, including $MeNO_3$, nitroglycol, nitroglycerin, mixts. of $MeNO_3$ with MeOH, Et_2O or $PhNO_2$ and explosive gelatins consisting of $MeNO_3$ with varying amts. of pyroxylin. The sample, in a metallic container 7 mm. in diam., was placed in a thick-walled bomb of 28-cc. capacity and ignited by means of a tuft of guncotton and an electrically heated wire. If combustion was converted to detonation, the container was destroyed. Combustion of $MeNO_3$ passed into detonation if d. of loading exceeded 0.009; for nitroglycol and nitroglycerin the limiting d. was 0.015. Addn. of inert materials and increase of pyroxylin content of gelatins hindered the transmission; this effect shows the influence of the phys. state.

C. G. Storm

Leningrad Inst. Chem. Phys.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

STEPANOV, B. M.

"Luminosity Temperature Measurements of the Explosion by Optical Method," Zhur. Eksper. i Teoret. Fiz., 16, 1946. Lebedev Physical Inst., Acad. Sci. USSR, Inst. Chem. Physics, -1946.

Investigation of the luminosity of the explosions of three liquids, methylnitrate, nitroglycol, and nitroglycerine, and establishment that the luminosity radiation depends on temperature, while the spectral distribution of energy obeys Wien's formula. 13T57

STEPANOV, L. A.

Dissertation: "A Question on the Introduction of Dynamic Variables in the Quantum Theory Fields." Cand Phys-Math Sci, Moscow Order of Lenin State U imeni M. V. Lomonosov, 12 Mar 54. Vechernyaya Moskva, Moscow, 3 May 54.

SO: SUM 284, 26 Nov 1954

STEPANOV, B. M.

3

Stepanov, B. M. On the introduction of dynamical variables in quantum field theory. Dokl. Akad. Nauk SSSR (N.S.) 100 (1955), 889–892. (Russian) 1-F/W

This is a purely formal discussion of the definition and transformation properties of dynamical variables in the "intermediate representation" of N. N. Bogolyubov [same Dokl. (N.S.) 82 (1952), 217–220; MR 13, 711]. The formulae are too complicated to be usefully summarized, but the basic definition is the following. A dynamical variable $A(x|g)$ is a function of the space-time point x and a functional of the real function $g(y)$. It satisfies the functional differential equation

$$\delta A(x|g)/\delta g(y) = i[A(x|g), L(x|g)] \text{ for } y_0 > x_0,$$

and

$$\delta A(x|g)/\delta g(y) = 0 \text{ for } y_0 < x_0.$$

Here $L(x|g)$ is the Lagrangian introduced by Bogolyubov.

F. J. Dyson (Princeton, N.J.).

STEPANOV, F.M., SHMELI, E.K., KONTANENTZ, A.C., SERENKY, N.N., ZELMANOV, I.L.,
(U.S.S.R.)

Some considerations on the operation of high current linear accelerators

CERN-Symposium on High Energy Accelerators and Pion Physics

Geneva 11-23 June 56
In Branch #5

SUBJECT USSR / PHYSICS
AUTHOR STEPANOV, B.M.
TITLE The Nonrelativistic Regularization of the S-Matrix.
PERIODICAL Dokl.Akad.Nauk, 108, fasc.6, 1045-1047 (1956)
Issued: 9 / 1956 reviewed: 10 / 1956

All regularization methods hitherto employed were relativistically covariant, and in some cases, when dealing with divergent expressions, covariance was even considered to be necessary. However, in the case of regularization the integrals can be broken off also nonrelativistically. On this occasion counter-terms must be defined in such a manner that, after the cancelling of regularization, the properties of relativistic covariance are restored. Here the possibility of such a definition is pointed out, on which occasion the effective HAMILTONIAN proves to be hermitian.
For reasons of correctness the fundamental idea is illustrated on the basis of quantum electrodynamics, but its applicability to every renormalizable theory is obvious. At first a regularizing LAGRANGIAN is given instead of the usual LAGRANGIAN of interaction, and the regularization factors occurring therein are chosen in such a manner that the effective HAMILTONIAN is hermitian. This may be attained by doing without the relativistic invariance of these factors, i.e. by admitting the dependence of these factors on some spacelike unit vectors. Ansatzes for these regularization factors are given which establish agreement among all diagrams. Regularization is thereby attained. The formulation of the R-operation with respect to the suggested regularization method is best demon-

strated on the basis of the results and denotations of the basic work by N.N.BOGOLJUBOV and D.V.ŠIRKOV, Usp.fis.nauk, 57, 3 (1955).
The FOURIER representation of the coefficient function from the T-product then has the form of a convergent integral. On the occasion of the cancelling of regularization the covariant properties are restored, but the integral expression loses its sense because of the divergence of integrals.
Now the structure of the counterterms of spinorial electrodynamics resulting in connection with this regularization method is explained. Because of the special part played by time the time-dependent, spatial, and mixed components must be investigated separately in vectors and tensors. The effective LAGRANGIAN of interaction thereby computed is explicitly given. The constants occurring therein are real and finite in every perturbational approximation and are chosen in such a manner that the S-matrix is relativistically invariant. This demand and the further demand concerning the equality of mass and charge with its experimental values fully determines all constants. In conclusion the possibility of a certain paradoxial result is pointed out.

INSTITUTION:

SUBJECT USSR / PHYSICS CARD 1 / 2 PA - 1634
AUTHOR LOGUNOV,A.A., STEPANOV,B.M.
TITLE The Dispersion Relation for the Reactions of the Photoproduction of Pions.
PERIODICAL Dokl.Akad.Nauk, 110, fasc. 3, 368-370 (1956)
Issued: 12 / 1956

These relations are here determined by the method developed by N.N.BOGOLJUBOV (forming the subject of lectures delivered in January 1956 in several seminars of the Mathematical Institute of the Academy of Science in the USSR). The matrix element of the photoproduction can be written down with the aid of the formalism of the S-matrix as follows:

$$S(k,\alpha;\, q',\omega) = (2\pi)^3 \langle \Phi^*_{p's'}\, \varphi_\varrho(-)(q')\, Sa^{(+)}_\nu(k)\, \Phi_{ps} \rangle$$

Here $\varphi^{(-)}_\varrho(q)$ denotes the absorption operator of a meson of the type $\varrho(\varrho = 1,2,3)$ and $a^{(+)}_\nu(k)$ (with $\nu = 0,1,2,3$) - the creation operator of a photon, Φ - the amplitude of state of the scatterer. The compound indices α and ω refer to the initial- and final state and comprise all quantum numbers characterizing the system (with the exception of the momenta of the photon and of the meson). A more exact expression for this matrix S is given. According to M.L.GOLDBERGER et al, Phys.Rev. 99, 979 (1955), ibid. 100, 986 (1955) it is possible to introduce a new amplitude $M_{\xi,\omega}$ of considerably

more simple structure, which is identical with the amplitude $T_{\xi,\omega}$ within the real domain of momenta. The expression for $M_{\xi,\omega}$ is explicitly written down and subdivided into a hermetic ($D_{\xi,\omega}$) as well as into an antihermetic ($A_{\xi,\omega}$) part.

Next, the theorem on analytic properties is employed. It is then easily possible to construct combinations of $A^{(\pm)}_{\xi,\omega}$ which have no line of intersection in the upper half-plane of E (the significance of E is not clearly defined). It is then possible to employ the generalized theorem by CAUCHY and to write down explicitly the dispersion relations for the processes of photoproduction. On this occasion it was assumed that in infinity the scattering amplitude has no pole of an order higher than the first. On the occasion of the practical application of the relations obtained here a phase analysis must be carried out. This problem will be investigated in the course of future works.

INSTITUTION: Mathematical Institute "V.A.STEKLOV" of the Academy of Science in the USSR

69263

9.4160

SOV/112-59-17-37146

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 17, p 196 (USSR)

AUTHOR: Stepanov, B.M.

TITLE: Emission Currents in an Electron Multiplier and Their Influence on Its Parameters and Functioning

PERIODICAL: V sb.: Nekotoryye vopr. inzh. fiz. Nr 1, Moscow, 1957, pp 66-82

ABSTRACT: The emission currents in a photo-multiplier lead to a dependence of the amplification coefficient on the light flux. With an increase in current the sensitivity of the multiplier has usually a linear fall until the bend of the characteristic, determined by Child's Law. An experimental law of corrections for the output current with allowance for the non-linearity of the characteristic, can be derived. The emission currents depend besides other factors on the geometry of the emitters and on the space charge. The geometry of the emitters reduces the amplification coefficient without causing a dependence of the coefficient on the current, as in this case the emission current is proportional to operating current. The linear dependence of the amplification coefficient on the current is caused by the space charge. Assuming the identity of the laws of spreading of the electronic beam in

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Emission Currents in an Electron Multiplier and Their Influence on Its Parameters and Functioning

photomultipliers of various design with an electrostatic focusing, the Poisson equation for a multiplier system of a simplified type can be solved and the result, by using the experimental dependence of the amplification coefficient on the output current, can be extended to the real multiplier systems. Expressions for the output current and for the electronic efficiency factor, are derived. The latter is the ratio of the amplification coefficient value in the upper bend of the characteristic to its maximum value. It is shown that the electronic efficiency factor increases rapidly with an increase in the secondary emission coefficient from 2 to 6, and then varies slowly.

Yu.I.T.

Card 2/2

STEPANOV B.M.

109-12-15/15

AUTHOR: Artemenkova, L.V.

TITLE: A Conference on Electron and Photo-electron Multipliers (Konferentsiya po elektronnym i fotoelektronnym umnozhitelyam)

PERIODICAL: Radiotekhnika i Elektronika, 1957, Vol.II, No.12, pp. 1552 - 1557 (USSR)

ABSTRACT: A conference took place in Moscow during February 28 and March 6, 1957 and was attended by scientists and engineers from Moscow, Leningrad, Kiev and other centres of the Soviet Union. Altogether, 28 papers were read and discussed. The papers were as follows:
1) B.M. Stepanov - "Some Problems of the Theory and Design of Electron Multipliers".
2) Ye.V. Yeliseyev, I.S. Ipatkin, A.A. Kalmykov, K.V. Mikerov and B.M. Stepanov gave some experimental data on electron multipliers operating at large currents and voltages.
3) P.V. Timofeyev and Ye.G. Kormakova - "Electron Multipliers of VEI (All-Union Electro-technical Institute)".
4) G.S. Vil'dgrube delivered a lecture on new types of electron multipliers employing alloy emitters.
5) N.S. Khlebnikov - "New Types of Photo-electron Multipliers".

Card 1/4

A Conference on Electron and Photo-electron Multipliers

6) A.G. Berkovskiy et alii communicated some results on the new types of industrial photo-electron multipliers.
7) L.I. Andreyeva et alii - "Electron Optics of Certain Special Electron Multipliers and its Characteristics".
8) L.V. Artemenkova et alii reported some results on the study of the dispersion of electrons in electron multipliers and its effect on their resolving power.
9) L.B. Artemenkova and B.M. Stepanov - "Resolving Power of Electron Multipliers and its Experimental Determination"
10) A.G. Berkovskiy and L.G. Leyteyzen gave some results on the photo-electron multipliers suitable for the discrimination of short-time intervals.
11) G.A. Vasil'yev reported on an investigation of the transient characteristics of photo-multipliers by means of a micro-oscillograph.
12) A.I. Veretennikov considered the problem of the measurement of the transient characteristics of photo-multiplers.
13) E.Ye. Berlovich gave some data on the transient characteristics of the photo-multipliers, type ФЭУ-19.
14) A.I. Belonosov determined the current time lag in the photo-multipliers, type ФЭУ-19 and ФЭУ-25.

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A Conference on Electron and Photo-electron Multipliers

15) Yu.A. Nemilov et alii also studied similar problems.
16) A.A. Osherovich investigated the basic parameters of the photo-multipliers, type ФЭУ .
17) A.Ye.Chidakov proposed a simple method for the measurement of the amplitude resolution of the multipliers.
18) A.Ye.Melamid - "Parameters of Photo-electron Multipliers and the Methods and the Equipment for their Measurement".
19) B.M. Stepanov gave some data on the characteristics of a multi-channel electron multiplier operating at high currents.
20) B.M. Glukhovskoy and Ye.I. Tarasov - "The Activation Technology of Alloy Emitters with Various Photo-cathodes".
21) A.N. Pisarevskiy studied the problem of the application of the Soviet-made photo-multipliers to scintillation spectroscopy.
22) I.F. Barchuk reported on the application of a spectrometric photo-multiplier to a scintillation γ-spectrometer.
23) A.I. Akishin lectured on the special electron multipliers which could be employed for the counting of ions.
24) Ye.L. Stolyarova reported on the experiments with a spectrometric photo-multiplier with an NaJ(Te) crystal.
25) A.A. Samokhvalov and I.G. Fakidov communicated some data

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A Conference on Electron and Photo-electron Multipliers

on a simple scintillation counter, its characteristics and its application in γ-type flaw detection.
26) O.D. Kovrygin and G.D. Latyshev reported on the application of the photo-electron-multipler, type ФЭУ-12, to the scintillation spectrometry and γ-type flaw detection.
27) N.G. Kokina gave some data on the application of electron multipliers to the monitoring of ultra-violet radiation.
28) N.K. Pereyaslova investigated the spectroscopic characteristics of the Soviet-made multipliers.
Very short summaries of the above papers are given.

SUBMITTED: July 3, 1957

AVAILABLE: Library of Congress

Card 4/4

SUBJECT USSR / PHYSICS

AUTHOR LOGUNOV,A.A., STEPANOV,B.M., TACHVELIDZE,A.N.

TITLE On the Part Played by Coupled States in the Processes of Photoproduction.

PERIODICAL Dokl.Akad.Nauk, 112, fasc.1, 45-47 (1957)
Issued: 2 / 1957

The present paper deals with the part played by coupled states in the dispersion states of the processes of photoproduction. The study of this process is important because it is connected with the analysis of the not observable energy domain in dispersion relations. The authors investigate the energy domain $E < |\vec{p}| + \mu^2/4|p|$, where the production of "coupled" states is possible. At first the antihermitic part of the amplitude of the reaction of photoproduction is explicitly written down. It is presumed that there are no coupled states of the meson-nucleon system between M and $M + \mu$. Here the domain of recoil momenta $\vec{p}^2 < M\mu/2$ is investigated. The integration domain in the dispersion relations (which were mentioned in the works by A.A.LOGUNOV and B.M.STEPANOV, Dokl. Akad.Nauk, 110, No 3 (1956)) are then separated into two parts: $0 < E' < (M\mu + (\mu^2/4) - \vec{p}^2)/\sqrt{M^2 + \vec{p}^2} < E' < \infty$. Within the first domain only the one-nucleon states make a contribution to the integral which is different from zero, the states with n 1 make a contribution only by way of the second domain. Strictly spoken, the second domain contains a part of the unobservable energy domain. However, the contribution made by this part can be made arbitrarily small

if the recoil momentum is fixed in a suitable manner.
Next, the average values of the currents, which occur here, are investigated, and the average value of the meson current is computed by way of an example. The average value of the electromagnetic current is computed in a similar manner. For the average value of the meson current the following expression is obtained: $\langle \overset{*}{\Psi}_{p',s'} J_Q(0) \Psi_{p,s} \rangle = g \langle \bar{u}_{s'}(p') \gamma^s \tau_{Q'} u_s(p) \rangle$. Here g is the renormalized pseudoscalar coupling constant of the meson- and nucleon fields. For the electromagnetic current one obtains:
$\langle \Psi_{p',s'} J_m(0) \Psi_{p,s} \rangle = \langle u_{s'}(p') \left\{ e \frac{1+\tau_3}{2} \gamma^m + \frac{1}{2} \hat{M} [(k\gamma), \gamma^m] \right\} u_s(p) \rangle$. Here e denotes the renormalized charge of the electron, μ_p and μ_n - the anomalous magnetic moments of the proton and the neutron and it holds that: $\hat{M} = \mu_p \frac{1+\tau_3}{2} + \mu_n \frac{1-\tau_3}{2}$
With the help of the formulae just mentioned it is possible without any trouble to write down the dispersion equations for photoproduction, whereby the "coupled" states are taken into consideration and in which the non-observable energy domain is separated. The complete analysis of the dispersion relations in the approximation for a fixed source gives results which are equivalent to those obtained by G.F.CHEW and F.E.LOW, Phys.Rev.101, 1579 (1956).

INSTITUTION: Moscow State University

20-118-5-17/59

AUTHOR: Stepanov, B. M.

TITLE: Remarks on Dispersion Relations for Pion Scattering on Nucleons (Zamechaniye po povodu dispersionnykh sootnosheniy dlya rasseyaniya π -mezonov na nuklonakh)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 118, Nr 5, pp.911-912 (USSR)

ABSTRACT: As is well known, the condition of causality serves as a foundation for the deduction of the dispersion relations in the one or the other form . It is generally assumed in the investigation of the scattering of pions on nucleons, that the pion represents an elementary particle, the behavior of which at infinity is described by the creation operators and by the anihilation operators of the pseudoscalar field. It is maintained, that such an assumption is not only sufficient, but also necessary for the deduction of the dispersion relations. The author here wants to show that this is not the case, for he here assumes that the elementary particle satisfying the condition of locality is the nucleon.

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Remarks on Dispersion Relations for Pion Scattering on Nucleons

No assumptions of this kind are made for the pion, that is to say that here a pion is understood to be represented by a certain bound complex according to N. N. Bogolyubov and D. V. Shirkov (Reference 1). The author here proves, using such an assumption that it is sufficient for the determination of the dispersion relations. In correspondence with the here given considerations the transition amplitude

$$S(\omega, p; \omega', p') = (2\pi)^3 \langle \Phi^*_{q',\varrho'} {}^{+}a_{s'}(p') S a_{s}(p) \Phi_{q,\varrho} \rangle \text{ is}$$

investigated, a^{-} and a^{+} denoting the creation and the annihilation operator of a nucleon. The spinor currents are here defined by the relations

$$j(x) = i\frac{\delta S}{\delta \bar{\psi}(x)} {}^{+}S; \quad \bar{j}(x) = i\frac{\delta S}{\delta \psi(x)} {}^{+}S .$$

The expression for S resulting from the application of the method of variation with respect to the spinor field in the usual way is here given explicitly. As an example the relation

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Remarks on Dispersion Relations for Pion Scattering on Nucleons

$$\gamma_e(1 - p)D(E) - \gamma_e(1 - p)D(E_o) =$$

$$= \frac{p}{\pi} \int_o^\infty 2E \frac{E^2 - E_o^2}{(E'^2 - E^2)(E'^2 - E_o^2)} \gamma_e(1 - p)A(E')dE'$$

is investigated. All other relations can be investigated in a completely analogous way. For the purpose of reducing this relation to the usual form, it is sufficient to perform a Lorentz-transformation from the coordinate system introduced here to Breit's system. The variables resulting in this way are written down. The properties of an here introduced matrix Z can be determined most simply by investigating the amplitude of the forward scattering, which is proportional to the invariant Lorentz total cross section. Expressions are written down for the contribution of the bound state to the initially given relation. It is easily possible to determine the explicit form of the matrix Z, it is, however, not given because of its enormous size. The initially given relation can be transformed into the standard form after ele-

Remarks on Dispersion Relations for Pion Scattering on Nucleons

mentary, however, lengthy computations. Hence, according to the opinion of the author it is sufficiently proved, that the assumption of the elementary character of the pion is not necessary for the deduction of the dispersion relations. The assumption of the elementary character of the nucleons is sufficient as well. There is 1 reference, 1 of which is Soviet.

PRESENTED: September 10, 1957, by N. N. Bogolyubov, Member, Academy of Sciences, USSR

SUBMITTED: September 9, 1957

STEPANOV, B. M.

PHASE I BOOK EXPLOITATION SOV/3247

2.1.8)

Moscow. Inzhenerno-fizicheskiy institut

Nekotoryye voprosy eksperimental'noy fiziki, vyp. 1 (Some Problems in Experimental Physics, Nr 1) Moscow, 1959. 85 p. 3,000 copies printed.

Sponsoring Agency: Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya SSSR.

Ed.: V.F. Semenov, Candidate of Physical and Mathematical Sciences, Docent; Tech. Ed.: R.A. Negrimovskaya.

PURPOSE: This book is intended for physicists, chemists and other persons interested in general problems of nuclear physics and physical and chemical analyses.

COVERAGE: The collection contains 10 articles dealing with problems in elementary particle acceleration, radiography and crystal structure, physical and chemical analysis and instrumentation in these fields. References and mention of personalities accompany each article.

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3-21-60

STEPANOV, B.M.
P.3

PHASE I BOOK EXPLOITATION SOV/3556

Moscow. Inzhenerno-fizicheskiy institut

Nekotoryye voprosy eksperimental'noy fiziki; [sbornik] vyp. 2 (Some Problems in Experimental Physics; Collection of Articles. Nr. 2) Moscow, Atomizdat, 1959. 123 p. 3,200 copies printed.

Sponsoring Agency: RSFSR. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya.

Ed.: B.M. Stepanov, Doctor of Physical and Mathematical Sciences, Professor; Tech. Ed.: S.M. Popova.

PURPOSE: This collection of articles is intended for graduate engineers and physicists engaged in the design of physics (laboratory) apparatus, and automatic and telemechanic equipment.

COVERAGE: This collection of articles on experimental physics was written by members of the Moscow Physics and Engineering Institute. Each article is accompanied by drawings and references.

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Some Problems (Cont.) SOV/3556

TABLE OF CONTENTS:

SOV/109-4-7-22/25

AUTHORS: Andreyeva, L.I. and Stepanov, B.M.

TITLE: Multi-channel Electron Multipliers

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 7, pp 1210 - 1212 (USSR)

ABSTRACT: The multi-channel electron multipliers described in the paper have an output current of up to 7 A, a time resolution of $2,5 \times 10^{-9}$ sec and an amplification coefficient of $10^8 - 10^9$. Figure 4 shows a four-channel electron-optical system, in which channels are connected in parallel to a single coaxial collector. Each channel contains 10 stages of multiplication and is provided with trough-like emitters. The collector is in the form of a short section of a 75-Ω coaxial line having slots on the external sheath. The electron optics of the input to the coaxial collector is shown in Figure 2. This construction provides a good screening of the collector field from the field of the output emitters and permits the elimination of the voltage changes on the collector

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Multi-channel Electron Multipliers

during the appearance of the current pulse. Figure 3 shows a two-channel electron multiplier where the collector is in the form of a capacitor operating in conjunction with a coaxial line. In this case, the construction of the collector ensures a good screening of the collector field from the fields of the output emitters. The electron optics of the near-cathode region of a two-channel system is shown in Figure 5. There are 5 figures and 5 English references.

SUBMITTED: January 25, 1958

Card 2/2

STEPANOV, B.M., prof., doktor fiz.-mat. nauk, otv. red.; ALYAB'YEV, A.F., red.; POPOVA, S.M., tekhn. red.

[Automatic and remote control] Avtomatika i telemekhanika; sbornik statei. Moskva, Izd-vo Gos. kom-ta Soveta ministrov SSSR po ispol'zovaniiu atomnoi energii, 1960. 98 p. (MIRA 14:9)

1. Moscow. Inzhenerno-fizicheskiy institut. - Chr. Automatics and Telemech. (Automatic control) (Remote control)

STEPANOV, B. M. with Arkhangel'skiy, I. A., and Yeremin, A. S., "Taking the Logarithms of Heavy Currents." p. 44 ibid.

ARUTYUNYANTS, [illegible]

[illegible] characteristics of large currents. Avtom. i telem.; [illegible] (MIRA 14:11)

1. Kafedra avtomatiki i telemekhaniki Moskovskogo inzhenerno-[illegible]

(Electric measurements)
(Nuclear reactors--Measurement)

86969 S/019/60/000/018/055/170
A152/A029

9,4140 (also 2801)

AUTHORS: Stepanov, B. M., Andreyeva, L. I.

TITLE: An Electronic Multiplier

PERIODICAL: Byulleteh' izobreteniy, 1960, No. 18, p. 32

TEXT: Class 21g, 13_{19}. No. 131841 (634593/26 of July 22, 1959). This multiplier has a wide-band lead-out (e. g., in the form of a coaxial line) for amplifying the rapidly-changing signals. It is distinguished by the following special feature: in order to widen the multiplier band, its collector is made of three electrodes: a solid electrode for taking up the pulse signals, and two wire-gauze electrodes, one of which delivers an exterior-source voltage.

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S/020/60/133/003/025/C 31/XX
B019/B067

AUTHOR: Stepanov, B. M.

TITLE: Structure of Nonrelativistic Counter-terms

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 3, pp. 547 - 549

TEXT: The author describes his method (Ref. 1) of constructing counter-terms for primitively divergent graphs. As the most simple case, he studies a spinor field with a pseudoscalar real meson field:

$$\mathcal{L}(x) = g{:}\Psi(x)\gamma^5\Psi(x){:}\varphi(x) \ .$$

It can be easily demonstrated that an expression for the functions of the coefficient of primitively divergent graphs in alpha representation, constructed with the aid of regularized propagators, contains integrals of the following form: $\int P(k_1, \ldots, k_n; p) \exp\left[i(ap_0^2 - a'\vec{p}^2) + 2i(p^0K^0 - \vec{p}\vec{K}')\right]dp$. $P(k_1 \ldots k_n; p)$ is a polynomial of the external momenta $k_1 \ldots k_n$, and of the internal momentum p. The constants a and a' obey the conditions

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Structure of Nonrelativistic Counter-terms S/020/60/133/003/025/031/XX
B019/B067

$a > 0$, $a' = a - i\delta$, $\delta > 0$. The calculation of this integral is discussed by an example for which a free particle of mass m performing a one-dimensional nonrelativistic motion is assumed. With the aid of this integral, an extensive expression is then obtained for the counter-terms of the mass operator of second order $\widetilde{\Sigma}_2(p)$. Expressions are also obtained for the counter-terms $\widetilde{R}_{\Sigma_2}(p)$, $\widetilde{R}_{\Pi_2}(k)$, $\widetilde{R}_{\Gamma_3}$, and $R_{\square_4}$. The author thanks Academician N. N. Bogolyubov for his interest in this work. There is 1 Soviet reference.

ASSOCIATION: Matematicheskiy institut im. V. A. Steklova Akademii nauk SSSR (Institute of Mathematics imeni V. A. Steklov of the Academy of Sciences USSR)

PRESENTED: March 28, 1960, by N. N. Bogolyubov, Academician

SUBMITTED: March 7, 1960

Card 2/2

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S/120/61/000/001/050/062
E032/E114

9.4130 (1138, 1141, 2801, 3201)

AUTHORS: Ipatkin, I.S., Stepanov, B.M., and Shatsukevich, A.F.

TITLE: Photomultiplier Detection of X-ray Pulses

PERIODICAL: Pribory i tekhnika eksperimenta. 1961 No.1, pp.165-166

TEXT: A large number of papers have been published in recent years giving descriptions of various pulsed, cold-emission X-ray tubes. The form of the X-ray pulse is usually recorded by a photomultiplier feeding an amplifier and a fast oscillograph. The use of an amplifier introduces a distortion into the form of the recorded X-ray pulse and complicates the measurements. The present authors report preliminary results of a study of the form of X-ray pulses obtained without the use of an amplifier. The ПГИ-8 (PGI-8) electron multiplier and the СК-19М (SK-19M) (ОК-19М) oscillograph were employed. The form of X-ray pulses from a continuously pumped, demountable X-ray tube was investigated. The tube voltage was derived from the ГИН-500 (GIN-500) pulsed-voltage generator. The electron multiplier PGI-8 consists of four parallel channels with ten multiplying stages in each. Cu-Be emitters and cathodes were used. They have a quantum yield of

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E032/E114

Photomultiplier Detection of X-ray Pulses

1.5×10^{-3} for slow electrons and X-ray energies between 0.2 and 1.5 MeV. The amplification coefficient is 10^7-10^8 and the applied voltage 500 volts per stage. The multiplier output is developed across a 75 ohm coaxial cable. The maximum output current per pulse is not less than 5 amps so that the signal can be applied directly to the oscillograph. The dependence of the form and duration of the X-ray pulses was investigated as a function of the material and form of the cathode, the distance between the cathode and the anode, and the pressure in the tube. The figure shows oscillograms of X-ray pulses as functions of the distance between the electrodes for cathodes in the form of aluminium (1) and molybdenum (2) needles, and a tantalum ring with a sharp rim (3). The anode of the tube was in the form of a plane molybdenum disc. The calibration trace on the photographs is a 10 Mc/s signal. The distance between the electrodes was varied between 55 mm (upper photographs) and 3 mm. As can be seen, the duration of the X-ray pulse decreases as the electrodes approach each other. The form, duration and amplitude of the

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E032/E114

Photomultiplier Detection of X-ray Pulses

pulses was found to be independent of the cathode material. When the tube incorporates a nitrogen trap, the form of the pulse remains stable when the pressure is increased to 10^{-3} mm Hg. When the tube is operated without the trap, the stability deteriorates. The optimum working conditions of the tube at a working voltage of 470 kV per pulse were: pressure 10^{-5} mm Hg, anode to cathode distance 25 mm. The amplitude of the pulse under these conditions does not vary by more than ± 3% over long periods of time. The total output of X-rays is then 10^{19} - 10^{20} quanta/sec with a pulse duration of (3-4) x 10^{-7} sec.
There are 1 figure and 5 references: 2 Soviet and 3 non-Soviet.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR
(Institute of Chemical Physics, AS USSR)

SUBMITTED: June 24 1959, and in final form December 19, 1959

Card 3/4

STEPANOV, B.M.

Formal definition of the R-operation. Dokl. AN SSSR 137 no.4:818-821 Ap '61. (MIRA 14:3)

1. Matematicheskiy institut im. V. A. Steklova AN SSSR. Predstavleno akademikom N.N. Bogolyubovym.
(Mathematical physics)

VETOSHKIN, S.S.; ROZOV, B.S.; STEPANOV, B.M.

Telemetering of single time intervals by means of spiral scanning. Avtom. i telem.; sbor. st. no.2:60-74 '62.
(MIRA 15:9)

(Telemetering) (Delay lines)

GOVOR, A.I.; ROZOV, B.S.; STEPANOV, B.M.

Telemetering of time intervals with multiple-line recording using a 18L0-47 tube. Avtom. i telem.; sbor. st. no.2:75-84 '62. (MIRA 15:9)

(Telemetering)

ARKHANGEL'SKIY, I.A.; MIKHEYEV, V.P.; STEPANOV, B.M.

Automatic device for measuring the light characteristics of photoelectric multipliers. Avtom. i telem.; sbor. st. no.2: 85-94 '62. (MIRA 15:9)
(Photoelectric multipliers) (Electronic measurements)

S/803/62/000/003/010/012
D201/D308

AUTHORS: Arkhipov, V.K., Stepanov, B.M. and Turkin, V.M.

TITLE: The charge storing operation of an oscillograph tube with the screen energized before recording

SOURCE: Moscow. Inzhenerno-fizicheskiy institut. Avtomatika i telemekhanika, no. 3, 1962. Sistemy upravleniya yadevnymi energeticheskimi ustanovkami, 70-85

TEXT: The authors give the results of experimental investigation into the -0,0 mode of operation of a CRT. The experiments have shown that qualitative changes of the display are determined basically during the recording process. The results of the experiments are in good agreement with data given in literature. Conclusions: 1) The actual brightness of the display signal is considerably lesser than its theoretically calculated value. 2) The increase in the beam current and in the potential of the potential carrier due to energizing of the screen does not affect substantially the display brightness. This, in turn, restricts the maximum recording speeds.

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